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SEAFLOOR GEOSCIENCES DIVISION: MISSIONS TECHNICAL
SPECIALTIES ACCOMPLISHM..(U) NAVAL OCEAN RESEARCH AND
DEVELOPMENT ACTIVITY NSTL STATION MS.. R H BENNETT

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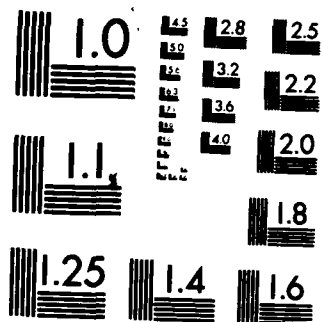
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NORDA Technical Note 214

Naval Ocean Research and
Development Activity

NSTL Station, Mississippi 39529



Seafloor Geosciences Division: Missions, Technical Specialties, Accomplishments, and Activities, 1982 to Early 1983



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Compiled by
Richard H. Bennett

Ocean Science and Technology Laboratory
Seafloor Geosciences Division

May 1983

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MISSIONS
TECHNICAL SPECIALTIES
ACCOMPLISHMENTS & ACTIVITIES

1982 to early 1983

SEAFLOOR GEOSCIENCES DIVISION
CODE 360

MARINE GEOLOGY
MARINE GEOPHYSICS
MARINE GEOTECHNICAL

Dr. Richard H. Bennett
Head, Seafloor Geosciences Division

Dr. Troy Holcombe
Head, Marine Geology Branch

Dr. Joe Gettrust
Head, Marine Geophysics Branch

Dr. Richard Bennett
Acting Head, Marine Geotechnical Branch

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ABSTRACT

The Seafloor Geosciences Division (formerly Sea Floor Division), one of six Divisions in the Ocean Science and Technology Laboratory (OSTL) of the Naval Ocean Research and Development Activity (NORDA), has undergone significant change during the latter part of 1982 and early part of 1983 (first half of FY 83). The addition of the Marine Geotechnical Branch (Code 363) provided a new dimension to the Division's existing capabilities that reside in the Marine Geology Branch (Code 361) and the Geophysics Branch (Code 362). During the year, new personnel joined the Division, adding technical supervisors, scientists, technicians, and clerical support to the research team. In order to more realistically reflect the mission of NORDA's Code 360, the name was officially changed to Seafloor Geosciences Division in April 1983.

The Seafloor Geosciences Division now provides the Navy with expanded and advanced capabilities to conduct comprehensive geological, geophysical, and geotechnical investigations of the sea floor and sub-sea floor. Basic and applied research studies contribute to the fundamental knowledge of the oceanic crust and overlying sediments and the effective utilization of the sea floor. Interdisciplinary seafloor science and engineering investigations are ongoing in support of Navy problems, systems design, construction, and operations. Studies provide quantitative and qualitative description and understanding of the seafloor geological materials and environmental parameters directed toward advancing the state-of-the-art. The major activities and capabilities of the Branches are briefly outlined in Figure 1. Cooperative studies with other NORDA Divisions, industry, academia, and other government agencies are an integral part of the Division's activities.

This informal report is a summary of the Seafloor Geosciences Division's research accomplishments and professional activities for 1982 and early 1983. The purpose is to provide NORDA Management and NORDA Offices (Codes) with a timely document on the Division's productivity and accomplishments. The report also is intended to provide a means of information exchange to system commands, oceanography commands and other Navy activities requiring seafloor environmental data. In addition, the report is designed to increase communication channels with colleagues interested in Division activities. Most reports cited are available from the authors. Communications are invited and should be directed to Division staff members and authors.

ACKNOWLEDGMENTS

Thanks are extended for the assistance of L. Nastav and K. McIntosh in preparing the manuscript. We also wish to acknowledge the contributions from NORDA Publications: to Annette Caples for the fine work in designing the Seafloor Geosciences Division logo, to Linda McRaney and Doug Johnston for editing, and to Sherryl Liddell for producing the final text.

**SEAFLOOR GEOSCIENCES DIVISION
CODE 360**

MISSION/BASIC RESPONSIBILITIES

The Seafloor Geosciences Division is responsible for managing and conducting geological, geophysical, and geotechnical investigations which advance the state-of-the-art. It provides the Navy with the understanding, description, modeling and quantitative prediction of marine geological environments in terms which relate to Navy systems design, construction and operations.

Telephone Number for Seafloor Geosciences Division:
(601) 688-4657, AUTOVON 485, FTS 494

**Dr. Richard H. Bennett, Head, Supervisory Oceanographer
(Interdisciplinary)**

Technical Specialties:

- Marine Geotechnique.
- Clay Microstructure.
- Seafloor Stability.
- In Situ Geotechnical Probe Development.
- Shallow Water and Deep-Ocean Piezometer Systems.

Ms. Karla Woodall, Administrative Assistant

Technical Specialties:

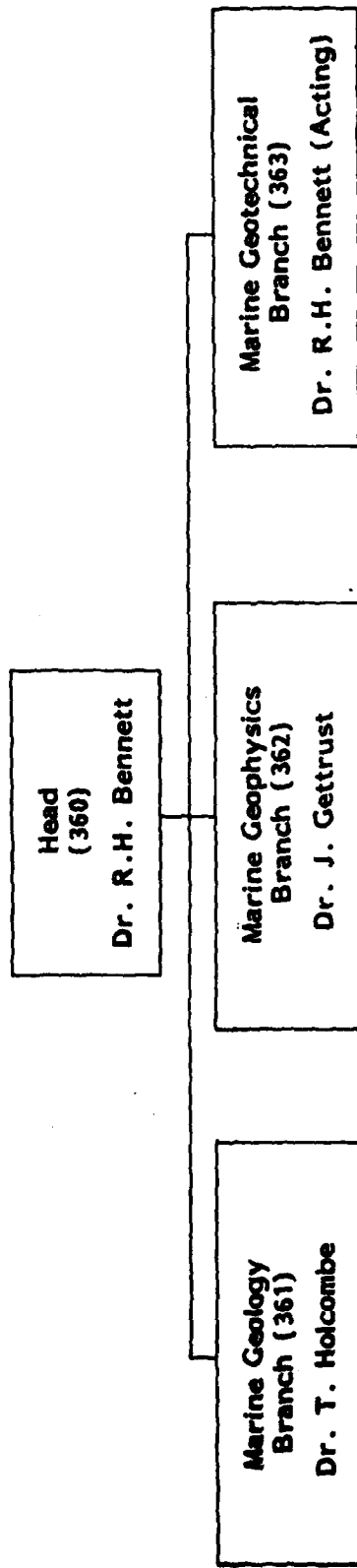
- Financial Records.
- Budgets.
- Personnel Records.
- Purchasing (Division Level).
- AIMAT Coordinator.
- Division Logistics.

Ms. Kathy McIntosh: Division Secretary

Technical Specialties:

- Division Correspondence.
- Word Processing.
- Maintains Record Control.
- Travel arrangements.
- Arranges meetings and conferences.
- Division Timekeeper.
- Provides guidance to Division clerical personnel.

NORDA Seafloor Geosciences Division



Sedimentology

Structural Geology

Seafloor Characterization

Processes

Sediment types/distribution

Acoustic Stratigraphy

Seafloor Morphology/bathymetry

Depositional Environments

Seafloor Environments

Geologic Mapping

Seismology

Magnetics

Plate Tectonics/processes

Acoustic Modeling

Acoustic/physical properties of sediments and crustal structure

Acoustic energy partitioning

Paleo-Oceanographic environments

QS3 (Quantitative Side-Scan Sonar)

Mass Physical/mechanical properties of soils (sediments)

Soil physics (shear and compressional waves)

Fundamental soil properties (clay microstructure)

Soil classifications/variability

Seafloor Stability

In situ measurement of soil properties

Soil behavior under static and dynamic loads

Mapping/trafficability

Seafloor gradients (slope maps)

1982 to early 1983
STATISTICS

CODE:	360	361	362	363	TOTALS
Papers/Books Published	see Code 363	3	4	7	14
Papers/Books in Press		5	5	4	14
Papers Submitted		3	2		5
Abstracts		4	2	1	7
Current Projects/Papers in Preparation		14	19	9	42
Presentations/Seminars	9	8	3	1	21
Developments (Instrumentation/Equipment)		1	7	2	10
Committees/Advisory Activities/Editorial Boards	19	6	8	see Code 360	33

PRESENTATIONS/SEMINARS

R. H. Bennett

Clay Fabric Versus Depth of Burial and the Development of Fissility in Submarine Sediments. Informal presentation: Int'l. Workshop on Fine-Grained Sediments, Deep Water Processes and Environments, Halifax, Nova Scotia, Canada, August 1982.

Engineering aspects of Deep-Ocean Piezometer Probe and Pore Pressure Events During ISHTE High Pressure Simulation Tests. NORDA, NSTL Station (Seminar), August 1982.

Deep-Ocean Piezometer System: Pore Pressure Events During High Pressure Simulation Tests, presented at the SEPM/NORDA Research Conference on Seafloor Stability of Continental Margins, Diamondhead, Miss., October 11-15, 1982.

Poster Presentations at the SEPM/NORDA Workshop, October 14, 1982.

1. Geotechnical, Geological and Geophysical Characteristics of the St. Croix Carbonate Margin (with F. Bowles, D. Lambert, F. Nastav).
2. Fabric and Geotechnical Properties of Submarine Sediments from Various Depositional Environments (multiple authors).
3. In Situ Piezometer Probe for Deep Ocean Sediments (with J. Burns).

Informal Briefing at NCEL, Port Hueneme, Calif., on NORDA's Sea Floor Division capabilities and current research studies in Marine Geology, Geophysics, and Geotechniques, November 1982.

Capabilities of the Sea Floor Division: Naval Ocean Research and Development Activity (NORDA); Informal Seminar at NAVFAC Ocean Engineering and Construction Office, January 1983.

Geotechnical and Geological Factors Affecting Offshore Engineering and Seabed Utilization on a Carbonate Margin. Presented at the 6th Annual Energy-Sources Technology Conference and Exhibition: Offshore Mechanics and Arctic Engineering Symposium, In: Current Advances in Ocean and Marine Engineering Section, February 1983.

COMMITTEES/ADVISORY ACTIVITIES/EDITORIAL BOARDS

R. H. Bennett

Co-Convener, session on Geotechnical Properties and Fabric: International Workshop on Fine-Grained Sediments, Deep-Water Processes and Environments, Halifax, Nova Scotia, Canada, sponsored by: The Geol. Soc. of London and the Geol. Assn. of Canada, August 16-18, 1982.

Member, ISHTE Project Planning Group, attended meeting and participated in 15th meeting at APL, University of Seattle, Wash., September 29-30, 1982.

Convener-Planner, SEPM/NORDA Research Conference on Seafloor Stability of Continental Margins: State-of-the-art Synthesis, October 1982.

Attended NORDA's Senior Management Meetings, Diamondhead, Miss., October 1982.

Attended NORDA's Middle Management Review Meeting 1982, NSTL Station, Miss.

Member, 1982, KSAP Committee for evaluation of applicants for Division Head, NORDA Code 340.

Participated in NORDA's management meetings on senior scientist promotions.

NRC advisor and sponsor for post-doctoral research associations in marine geotechniques, geology, and geophysics (NORDA).

Member, Geotechnical Consortium for DSDP Leg 75, special studies on geotechnical properties of HPC samples with Lehigh University, San Diego State University, TAMU, Oregon State University, University of Rhode Island, NOAA, University of Colorado at Boulder, 1980-1982.

Member, DSDP/IPOD Sedimentary Petrology and Physical Properties Panel (SP-4) and Working Group on Research Activities.

Member, Working Group on Long-Range Planning for SP-4 Panel, Deep-Sea Drilling Project/IPOD.

DSDP/IPOD-4 Liaison for Engineering Developments (down-hole measurements, techniques, coring, in situ measurements).

Attended SP-4 Advisory Panel meeting at DSDP, Scripps Institution of Oceanography, La Jolla, Calif., Dec. 1982; meeting with DSDP Engineering Development Group to review current and proposed down-hole tools and instrumentation; consulted with

DSDP scientists and technicians concerning engineering aspects of the DSDP down-hole piezometer probe.

Adjunct Professor, Texas A&M University, appointed February 1983.

Adjunct Associate Professor, Ocean Engineering Division, University of Miami, 1979-present.

Member, Editorial Board, International Journal of Applied Ocean Research.

Member, Editorial Board, Marine Geotechnology, an international journal of seafloor science and engineering.

Special Editor: Geomarine Letters issue on Seafloor Stability of Continental Margins: resulting from SEPM/NORDA Research Conference. October 1982.

MAJOR ACCOMPLISHMENTS

R. H. Bennett

Convened SEPM/NORDA Research Conference on Seafloor Stability of Continental Margins. Diamondhead, Miss. October 11-15, 1982.

Developed and implemented "Promotion Evaluation Matrix Technique" for NORDA middle management. Implemented evaluation system, 1982.

Established the Marine Geotechnical Branch, Code 363, April 4, 1983, and reorganized the division.

Developed format (chart) for evaluating NORDA's scientific, basic, and applied papers and reports.

Participated in NORDA's EEO/Affirmative Action Activities.

**MARINE GEOLOGY BRANCH
CODE 361**

MISSION/BASIC RESPONSIBILITIES

Marine Geology investigations of coastal and deep-ocean environments are directed toward the understanding of the sedimentology, structural geology, acoustic stratigraphy, processes and environmental parameters as they relate to Navy activities. Advanced field and laboratory techniques are utilized to improve the quality and resolution of geological parameters which advance the state-of-the-art. Consultation and service activities are in direct support of Navy requirements. Regional and site specific studies are designed to provide improved description of the geological environments and to advance predictive modeling capabilities.

Telephone Number for Marine Geology Branch:
(601) 688-4906, AUTOVON 485, FTS 494

Dr. Troy Holcombe, Branch Head (Supervisory Geologist), Science and Technical Manager of Branch activities

Technical Specialties:

- Broad experience in Marine Geology, including geomorphology, stratigraphy, and structural geology/tectonics.
- Caribbean regional geology.
- Geological interpretation of geophysical data, principally seismic reflection data.

Ms. Trisha Hebert, Secretary

Technical Specialties:

- Functions as Secretary for Marine Geology Branch, Geophysics Branch, and Marine Geotechnical Branch.
- Types correspondence, reports, etc., for three Branches.
- Coordinates telephone calls and visitors for Branch personnel.
- Maintains and controls office files and records.
- Word processing.

Dr. Frederick A. Bowles, Oceanographer

Technical Specialties:

- Sedimentation.
- Stratigraphy.
- Mineralogy.

These disciplines are employed to extend our knowledge of the seafloor environment, specifically relating to such things as

bottom current patterns, climatic influences on sedimentation, delineation of depositional history, sediment dispersal, etc.

Dr. Peter Fleischer, Geologist

Technical Specialties:

- Marine Geology.
- Sedimentation.
- Sedimentary processes and geology of continental margins.
- Geologic processes of coastal and estuarine environments.
- Deep sea bedforms and sediment transport.
- Seafloor characterization techniques.
- Clay mineralogy.

Mr. Julius Egloff, Geologist

Technical Specialties:

- Seafloor Geology.
- Geomorphology.
- Tectonics of continental margins and mid-ocean rises.
- Survey technologies.
- Interpretation of seismic reflection, side-scan sonar, and bathymetric data.
- Geographically specializing in the North Atlantic Ocean, Greenland-Norwegian Seas, Labrador Sea, Gulf of Mexico, Caribbean and Mediterranean and North Seas, etc.

Ms. Anna M. Einwich, Oceanographer

Technical Specialties:

- Marine Geology.
- Geomorphology.
- Ocean basin history (and related studies) through interpretation of seismic and magnetic data, bottom photographs and cores.

Mr. William B. Sawyer, Geologist

Technical Specialties:

- Marine Geology.
- Marine Geotechnique.
- Sedimentology.
- Seafloor classification using side-scan sonar and 3.5 kHz subbottom profiling.
- Classical sedimentological and geotechnical laboratory techniques of marine sediments.
- Marine geological field techniques and methods including bottom sampling and photography, seismic reflection profiling, side-scan sonar and field sample processing.

Mr. Walter H. Jahn, Physical Science Technician

Technical Specialties:

- Deep Ocean Photography.
- Marine Geology.
- Coring Program.
- Constructing, fabricating, designing various oceanographic instruments and packages to be used at sea.

Dr. Raymond P. Freeman-Lynde, NRC-NORDA Cooperative Associate

Technical Specialties:

- Marine Geology.
- Sedimentology.
- Carbonate Sedimentology.
- Continental Margins: Marine geology of continental margins with emphasis on steep carbonate escarpments at passive continental margins.

PAPERS/BOOKS PUBLISHED

Fleischer, P., S. Tooma, and W. H. Howard, 1982. Mine Burial Tests in the Shallow Water Approaches to Norfolk, Virginia (U). NORDA Technical Note 106, 46 p.

Howard, W. H., J. L. Raban, S. Tooma, P. Fleischer, C. Ingram, and J. N. Suhayda, 1982. Field Evaluation of Three Commercial Side-Scan Sonar Systems (U). Naval Coastal Systems Center, NCSC TR 368-82, 44 p.

Jahn, W. H., T. Simkin, D. J. Stanley, and P. T. Taylor, 1982. Deep-Ocean Photography: A Study of the Gilliss Seamount. Marine Technology Society Journal, v. 16, pp. 11-22.

PAPERS/BOOKS IN PRESS

Bowles, F. A. and W. H. Jahn. Geological/Geophysical Observations and Inferred Bottom Current Flow: South Flank Iceland-Faeroe Ridge. Marine Geology.

Part I (Introduction) F. A. Bowles, J. Egloff, Part II (Geology and Geophysics) R. H. Bennett, D. N. Lambert, G. F. Merrill, and F. L. Nastav, Part III (Geotechnical Investigation), W. J. Burton. Seafloor Environments, North St. Croix Margin and Virgin Islands Trough. NORDA Report No. 51.

Fleischer, P., S. Tooma, and W. H. Howard. Mine Burial Tests in the Shallow Water Approaches to San Diego, California (U). NORDA Technical Note 208. CONFIDENTIAL

Fleischer, P., S. Tooma, and W. H. Howard. Mine Burial Tests in the Shallow Water Approaches to Galveston, Texas (U). NORDA Technical Note 213. CONFIDENTIAL

Gorsline, D. L., H. A. Karl, D. E. Drake, R. L. Kolpack, S. E. Thorinton, and P. Fleischer. California Borderland Suspended Studies. IAS Symposium on Fine-Grained Sediment Transport.

PAPERS SUBMITTED

Case, J. E., T. L. Holcombe, and R. G. Martin. Experimental Map of Geologic Terrain in the Caribbean Region. Submitted for inclusion in a GSA Memoir containing a collection of papers on the continental margin of northern South America.

Egloff, J. and G. L. Johnson. The Discovery of a Tensional Release Feature on the Insular Slope/Rise of W. Iceland, and Comparison with SE Greenland Canyons and Slumps. Geomarine Letters Special Issue.

Holcombe, T. L. and G. F. Sharman. Post-Miocene Cayman Trough Evolution: A Speculative Model. Geology.

ABSTRACTS

Egloff, J., G. Sommerhoff, and G. L. Johnson, 1982. Canyons, Submarine Fans, and Older Structures of Southern Greenland Continental Margin from Seismic Surveys. AAPG Annual Convention Abstracts, p. 47.

Feuillet, J. P. and P. Fleischer, 1982. Effect of Circulation on Clay Mineral Distribution on the Southeastern U.S. Continental Slope. EOS, v. 63, p. 991.

Freeman-Lynde, R., Cretaceous and Tertiary Dredge Samples from the Florida Escarpment, Eastern Gulf of Mexico. GCAGS Annual Convention, Jackson, Miss. (abs.)

Freeman-Lynde, R., Subsidence of the Bahama Platform and the Nature of its Underlying Crust and Lithosphere, American Geophysical Union Annual Spring Meeting, Baltimore, Md. (abs.)

CURRENT PROJECTS/PAPERS IN PREPARATION

Bowles, F. A., Possible Late-Wurm Moraine on the Iceland-Faeroe Ridge.

Bowles, F. A. and others. Geological Environment West of St. Croix.

Bowles, F. A., Paleo-Climatic and Paleo-Oceanographic Implications of Feldspar/Quartz Variations in N. Atlantic Cores.

Egloff, J., Sediment Dynamics of the Southeast Greenland Continental Margin.

Fleischer, P. and J. P. Feuillet, Deposition of Clay Minerals on the Continental Slope by the Circulation Complex Off Southeastern United States.

Freeman-Lynde, R. P., Subsidence of the Bahama Platform and the Nature of the Underlying Crust.

Freeman-Lynde, R. P. and W. B. F. Ryan, Erosion of the Bahama Escarpment.

Freeman-Lynde, R. P., P. Popenoe, and F. W. Meyer, Seismic Stratigraphy of the Western Straits of Florida.

Freeman-Lynde, R. P., M. B. Cita, F. Jodone, E. L. Miller, H. Chezar, A. Russo, and W. B. F. Ryan, The Development of the Modern Foreslope of Exuma Sound Off Southern Eleuthera Island.

Holcombe, T. L., Geomorphology, Sedimentation History, and Structural Evolution of Caribbean Interior Basins and Ridges.

Holcombe, T. L. and G. F. Sharman, Evolution of Cayman Trough from Magnetic Inversion and Block Modeling.

Holcombe, T.L., J. Ladd, R. von Huene, and G. Westbrook, Regional Geology of the Caribbean Sea Floor.

Jahn, W. H., D. K. Young, and M. D. Richardson, Quantification of Deep-Sea Lebensspuren from Photographs: A Comparison Among Sedimentary Provinces of the Venezuela Basin, Caribbean Sea.

Sen Gupta, B., Late Quaternary Benthic Foraminifera of Southern Norwegian Sea: Stratigraphic Trends of Dominant Species.

PRESENTATIONS/SEMINARS

Egloff, J., G. Sommerhoff, and G. L. Johnson

Canyons, Submarine Fans, and Older Structures of Southern Greenland Continental Margin from Seismic Surveys. AAPG Annual Convention, Calgary, Alberta, Canada, July 1982.

Egloff, J. and G. L. Johnson

The Discovery of a Tensional Release Feature on the Insular Slope/Rise of W. Iceland, and Comparison with SE-Greenland Canyons and Slumps. SEPM/NORDA Conference on Seafloor Stability, Diamondhead, Miss., October 1982.

Fleischer, P.

Presented Continental Margin Sedimentation Lectures for a Graduate Marine Geology Course (MRSC4210) offered by the Department of Marine Sciences, Louisiana State University, at NSTL, October 1982.

Feuillet, J. P. and P. Fleischer

Effect of Circulation on Clay Mineral Distribution on the Southeastern U.S. Continental Slope. AGU Meeting, San Francisco, Calif., December 1982.

Holcombe, T. L.

Presented nine 3-hour lectures in a graduate marine geology course (MRSC4210) offered by the Department of Marine Sciences, Louisiana State University, at NSTL, September-November, 1982.

Presented preliminary chapter outline and summary of plans for the marine geology chapter, Caribbean Volume, Decade of North American Geology, sponsored by the Geological Society of America. Presented at an organizing meeting, Miami, Fla., January 1983.

Presented a synopsis of plans and scientific rationale for the South Atlantic geocorridor research program to an organizing workshop for ONR-sponsored research in the South Atlantic and Southwestern Indian Oceans. Palisades, N.Y., March 1982.

Jahn, W.H.

Presented talk on viewing the deep-ocean floor through photography: museum lecture series, Museum of Natural History, Smithsonian Institution, Washington, D.C. Officially presented the Deep Ocean Photography Exhibit. Provided press interview on the exhibit for The Washington Post, January 1982.

DEVELOPMENTS (INSTRUMENTATION/EQUIPMENT)

Jahn, W. H., 1982, Department of Navy, Office of Naval Research, invention disclosure: A remote controlled camera system--Navy Technical Disclosure Bulletin, v. 7, no. 4, p. 43-46.

COMMITTEES/ADVISORY ACTIVITIES

Bowles, F. A., MS thesis advisor for D. Lavoie, Sediments on the Southeastern Flank of the Bermuda Pedestal, University of New Orleans, defended September 1982.

Fleischer, P., MS thesis advisor for J. E. Dubuisson, Dredged Eocene Carbonates, North Carolina: Petrography, Petrology, and Sedimentary Environments, University of Southern Mississippi, defended May 1982.

Fleischer, P., MS thesis advisor, for J. A. Green. Evaluation of Large Scale Ocean Slopes, Their Surficial Geology, and Their Relationship to Acoustic Modeling, University of New Orleans, defended August 1982.

Holcombe, T. L., MS thesis advisor for J. Cooley. Structure and Stratigraphy of the Offshore Margin of the Dominican Republic, University of Southern Mississippi, defended 1982.

Holcombe, T. L., Named as coordinator for marine geology chapters in the Caribbean volume, Decade of North American Geology, sponsored by the Geological Society of America (GSA). For its centennial, GSA is sponsoring the preparation and publication of a 27-volume set of books on the regional geology of North America.

Holcombe, T. L., Named as compiler of the Caribbean portion of the Geological map of North America, which is being prepared for the Decade of North American Geology, sponsored by the GSA. In addition to the 27 volumes on the regional geology of North America, which GSA is preparing for its centennial, major new geological and tectonic maps are also being compiled.

MAJOR ACCOMPLISHMENTS

Egloff, J.

Geologist (consultant) and navigator for "SEAS" project on USNS BARTLETT Cruise, Glasgow to Reykjavik to Glasgow, August/September 1982.

P. Fleischer

Co-organizer and major participant in mine burial severity tests, San Diego, Calif., Jan. 1982, and Galveston, Tex., April 1982.

Provided side-scan sonar survey for ARL-UT high frequency acoustic test off Mission Beach, Calif., May 1982.

Collected geological samples and seismic data for NRL shallow water acoustic tests, in Gulf of Maine, August 1982.

Performed side-scan sonar survey off Mobile, Alabama, to locate Dauphin Island Bridge rubble, for Mississippi-Alabama Sea Grant Consortium, December 1982.

Freeman-Lynde, R. P., J. Egloff, W. H. Jahn, and F. A. Bowles

Conducted a geological cruise to the West Florida escarpment, October-November 1982; obtained 61 dredge hauls and 11 camera lowerings; sampled and photographed Cenozoic and Cretaceous sedimentary strata of the escarpment, making possible a major study of the stratigraphy and geological evolution.

T. L. Holcombe and F. A. Bowles

Coordinated the planning and preparation for the South Atlantic Geocorridor expedition; obtained commitment for ship time.

W. H. Jahn

Photographic exhibitions of the Deep Ocean Photography Exhibit, Smithsonian Institution, Washington, D.C. Sponsored by NORDA and NAVOCEANO, January 22-April 18, 1982.

Photographic exhibitions of the Deep Ocean Photography Exhibit (selected photos), International Hydrographic Conference, Monte Carlo, Monaco. Sponsored by NORDA and NAVOCEANO, April 20-30, 1982.

Photographic exhibitions of the Deep Ocean Photography Exhibit (selected photos), OCEANS 82, Washington, D.C. Sponsored by NORDA and NAVOCEANO, September 20-22, 1982.

Photographic exhibitions of the Deep Ocean Photography Exhibit, American Museum of Natural History, New York. Sponsored by NORDA and ONR, January 22-May 15, 1983.

**MARINE GEOPHYSICS BRANCH
CODE 362**

MISSION/BASIC RESPONSIBILITIES

Emphasis is on the development of research programs in seismology (geoacoustics), geomagnetism/plate tectonics, and geoelectric fields and methods. Field investigations and theoretical modeling are integral aspects of the geophysical programs: Includes quantitative and statistical analysis of a broad spectrum of geophysical data in support of Navy requirements. Cooperative interdisciplinary investigations are directed toward advancing the state-of-the-art in seismology, geomagnetism, and geoelectric techniques.

Telephone Number for Geophysics Branch:
(601) 688-4906, AUTOVON 485, FTS 494

Dr. Joseph Gettrust, Branch Head (Supervisory Geophysicist),
Science and Technical Manager of Branch

Technical Specialties:

- Solid Earth Geophysics, specializing in seismology.
- Marine Geology, especially structure of the crust and upper mantle and its seismological expression.
- Application of mathematical physics and computers to geophysical and geological problems.
- Digital computers and geophysical instrumentation and their experimental applications.
- Management of large-scale geophysical field and laboratory programs.

Dr. G. Lafayette Maynard, Senior Research Geophysicist

Technical Specialties:

- Seismology and seismic instrumentation; especially exploration seismology at sea.
- Observatory (earthquake) seismology.
- General marine geophysics and geological oceanography.

Dr. David Handschumacher, Geophysicist

Technical Specialties:

- Plate Tectonics (seafloor spreading).
- Geomagnetism (plate tectonics, geomagnetic reversals, oceanic crust, seamounts).
- Aeromagnetic Survey Operations.

Ms. Muriel S. Grim, Geophysicist

Technical Specialties:

- Geology and geophysical properties of the U.S. Atlantic Continental Margin.
- Exploration seismology-processing and analysis of seismic data.
- Geology: tectonic and sedimentary processes on the U.S. Atlantic continental margin.

Mr. James E. Matthews*, Geophysicist

Technical Specialties:

- Geophysics: seismic reflection interpretation, long wavelength magnetic modeling, development of regional geological/geophysical synthesis.
- Geotechnical: dynamic elastic moduli measurement technique, shear wave measurements in soft solids.

Mr. Eugene Morgenthaler, Geologist

Technical Specialties:

- Field Investigations: Collection, processing, and compilation of geomagnetic data.
- Study of crustal structure, age and evolution.
- Analysis and interpretation of airborne/marine magnetic data.
- Scientific support of Geomagnetism and Plate Tectonics Program.

Ms. Dawn Lavoie*, Geologist

Technical Specialties:

- Carbonate Petrology.
- Sedimentation (especially coastal processes).
- Clay mineralogy.

Mr. Frank Carnaggio*, Senior Electronic Technician

Technical Specialties:

- Design and development of transducers and systems used to measure, record, and analyze physical properties such as temperature, pressure, shear and compressional wave velocities for use in the laboratory as well as for use in remote locations and hostile environments.
- Design and development of facilities such as precision thermal baths and pressure chambers used in testing and

calibrating physical parameter measurement transducers and systems.

Mr. Steve Madosik III, Physical Science Technician

Technical Specialties:

- Computer programming.
- Data base management.
- Computer data processing.

Mr. David C. Young*, Mechanical Engineering Technician

Technical Specialties:

- Machinist, performs a wide variety of machine work for fabrication of various experimental prototype equipment; designs mechanical subsystems and systems for geotechnical research; modifies existing equipment to suit specific needs, researches feasibility and availability of existing equipment and materials which could be used in prototype equipment, upkeep and maintenance of lab and workshop equipment.

*Personnel reassigned to the Marine Geotechnical Branch in 1983. Work reported here was performed as part of the Marine Geophysics Branch function.

PAPERS/BOOKS PUBLISHED

Kempner, W. C., and J. F. Gettrust, 1982. Ophiolites, Synthetic Seismograms, and Oceanic Crustal Structure, 1. Comparison of Ocean Bottom Seismometer Data and Synthetic Seismograms for the Bay of Islands Ophiolite. J. Geophys. Res., 87, B10, pp. 8447-8462.

Kempner, W. C., and J. F. Gettrust, 1982. Ophiolites, Synthetic Seismograms, and Oceanic Crustal Structure, 2. A Comparison of Synthetic Seismograms of the Sanail Ophiolite, Oman, and the ROSE Refraction Data from the East Pacific Rise. J. Geophys. Res., 87, B10, pp. 8463-8476.

Matthews, J. E., 1982. Geoacoustic Models for the Straits of Sicily and Sardinia-Tunisia; NORDA Tech. Note 99.

Matthews, J. E., 1982. An Operational Summary of the BERMEX 81-V3 Experiment: September 17-19, 1981; NORDA Tech. Note 153.

PAPERS/BOOKS IN PRESS

- Behrendt, John C., and Muriel S. Grim. Second Vertical Derivative and Other Filtered Maps of a High Sensitivity Aeromagnetic Survey Over the U.S. Atlantic Continental Margin and Their Application to Regional Tectonics. SEG Volume on Gravity and Magnetic Maps.
- Berkson, J. M. and J. E. Matthews. Statistical Properties of Seafloor Roughness; Acoustics and the Sea-Bed, Univ. of Bath, Bath, England.
- Green, J. A. and J. E. Matthews. Global Analysis of the Shallow Geology of Large-Scale Ocean Slopes. NORDA Tech Note 197.
- Hsu, Vindell, J. F. Gettrust, C. E. Helsey, and E. Berg. Local Seismicity Preceding the March 14, 1979, Petatlan, Mexico Earthquake (Ms=7.6) J. Geophys. Res.
- Lavoie, D. and J. E. Matthews. Sediments on the Southeastern Flank of the Bermuda Pedestal. NORDA Tech. Note 198.

PAPERS SUBMITTED

- Handschumacher, D. W., and D. R. Bracey, Northwest Pacific Magnetic Anomaly Chart, Map and Chart Series MC-47. Geol. Soc. Am. (accepted for publication).
- Handschumacher, D. W., E. J. Morgenthaler, and S. Madosik, Image of Minimum Shoal Depths Recorded in 30 x 30 nm Areas of the North Atlantic, EOS.

ABSTRACTS

- Matthews, J. E., B. A. Brunson, M. D. Richardson and F. S. Carnaggio, 1982. Shear Wave Measurements at OSTL. SEG/USN Shear Waves and Pattern Recognition Symposium, March 1982.
- Brunson, B. A. and J. E. Matthews, 1982. Laboratory Measurements of Shear Wave Attenuation in Natural and Synthetic Sediments. SEG/USN Shear Waves and Pattern Recognition Symposium, March 1982.

CURRENT PROJECTS/PAPERS IN PREPARATION

- Bracey, D. R., J. E. Andrews, and D. W. Handschumacher. Philippine Sea Magnetic Anomaly Chart.
- Gettrust, J. F. and L. N. Frazer. The Implementation of the Filon Integration Technique for the Computation of Synthetic Seismograms (to be submitted to Bull. Seis. Soc. Am.).
- Mortera, C. A. and J. F. Gettrust. On the Crustal Structure of the Hess Rise, (to be submitted to J. Geophys. Res.).
- Schreiner, A. E. and J. F. Gettrust. Velocity Structure in the PROZCO Fracture Zone from Seismic Refraction Data (to be submitted to J. Geophys. Res.).
- Grim, M. S. Processing and Analyzing MSS Sparker Data Preparatory to a Site Survey Report for DSDP Leg 88.
- Grim, M. S. Fabrication of a VLF Project Reading File and a Summary of the Geology and the Geophysical Studies in the Vicinity of Charleston, S.C. for the Project.
- Grim, M. S. Compilation of Seismic Refraction Data from the Coastal Plain (Onshore and Offshore) of North and South Carolina; an On-Going Endeavor With Possibilities of Becoming Part of the VLF Project.
- Handschumacher, D. W., Origin of Jurassic Magnetic "Quiet" Zone: Extension of the Mesozoic Geomagnetic Reversal Time Scale.
- Handschumacher, D. W., J. F. Campbell, and L. Kroenke. Tectonic Setting of the Marshall Islands; A Marine Magnetic Anomaly Study.
- Handschumacher, D. W., E. J. Morgenthaler, and W. Sager. Aeromagnetic Detection of Three Large Uncharted Seamounts Near Wake Island.
- Lavoie, D., FODS (Outpost Resolution)--Washington Shelf/Slope Area.
- Lavoie, D., South Atlantic--Seismic Stratigraphy.
- Lavoie, D., Shear and Compressional Wave Measurements, Dredge Samples.
- Lavoie, D., Seamount Paper.
- Lavoie, D., Seismic Stratigraphy of the South Atlantic.
- Lavoie, D., Outpost Resolution: Data Analysis.

Matthews, J. E. and D. C. Young. Mechanical Details of a Modified Hamilton Frame Velocimeter; NORDA Tech. Note.

Matthews, J. E., F. S. Carnaggio, and M. Richardson. On Shear and Compressional Probes for Box Cores), Journal Pub.

Regan, E. D., D. W. Handschumacher, and J. Frawley. Origin of the Satellite Magnetic Anomaly over the Broken Ridge.

PRESENTATIONS/SEMINARS

Gettrust, J. F.

The Relationship of the Long-Range Pn and Sn Phases to Oceanic and Upper Mantle Structure. NRL, Washington, D.C., March 1982.

Matthews, J. E.

Dynamic Elasticity of Measurement in "Soft" Solids, University of New Orleans, Dept. of Physics.

Lavoie, D.

Seamount presentation for 6.2 Bottom Interaction Program-- results of last year's work.

DEVELOPMENTS (INSTRUMENTATION/EQUIPMENT)

Carnaggio, F., J. Matthews, and D. Young. Designed and developed in situ compressional and shear wave velocity measurement system (Navy patent applied for).

Carnaggio, F., Designed and developed "match-box" signal 60 dB preamplifier for use with piezoelectric transducer.

Carnaggio, F., Designed and built an electronic device to aid in measurement of shear and compressional wave velocities (at the frequencies of interest the standard deviation of a group of 20 measurements made by a skilled operator using conventional techniques is 50 microseconds; in approximately the same time using the new device, 100,000 measurements were taken with a standard deviation of 200 picoseconds, or an improvement of 5 orders of magnitude).

Matthews, J. E., V_p and V_s Probes for box cores.

Matthews, J. E., Modified Hamilton Frame.

Maynard, G. L., Performed preliminary work on specifying parameters and components for Code 360 mini-computer.

Young, D. C., J. E. Matthews, Design and development of numerous shear and compressional wave transducers (for a variety of laboratory measurements).

COMMITTEES/ADVISORY ACTIVITIES

Gettrust, J. F.

Edited for Journal of Geophysical Research and Bulletin of the Seismological Society of America.

Gettrust, J. F.

Reviewed proposals for the National Science Foundation.

Gettrust, J. F.

Member of the University Research Council, University of Hawaii.

Gettrust, J. F.

Served on NORDA's ADP Users Group Committee.

Grim, M.

Reviewed proposal for the National Science Foundation February 1983.

Handschumacher, D.

Participated in planning for the proposed South Atlantic "Geocorridor" SURVOPS in FY 84.

Matthews, J. E.

Member-APP Bottom Loss Evaluation Committee.

Maynard, G. L.

Continued to serve as advisor on DTAGS development program.

MAJOR ACCOMPLISHMENTS

F. S. Carnaggio

Designed and built precision thermal bath; 65 gallon capacity tank with demonstrated stability of $\pm 0.0005^{\circ}\text{C}$ per 30 minutes.

J. F. Gettrust

Served as SNS on MSS-82 cruise to NW Pacific. During this cruise worked with Oregon State University at the Hawaii Institute of Geophysics. Ocean Bottom Seismographs (OBSs) were launched and retrieved without loss, and seismic refraction profiles to the OBSs and at a borehole seismometer were run. Preliminary results indicate that the noise level at the borehole seismic system is considerably less than for the OBSs.

D. Handschumacher

Located and mapped sequences of low-amplitude, linear anomalies in the Jurassic magnetic "quiet" zone of the Western Pacific. The anomalies have been interpreted to be the oldest known seafloor spreading anomalies, an interpretation that has allowed us to: (1) extend the geomagnetic reversal time scale into middle Jurassic time; (2) produce the first empirical evidence that the world's widely distributed Jurassic "quiet" zones evolved from seafloor spreading during an extended period of frequent reversals, rather than constant polarity, of the earth's dipole field; and (3) establish important new criteria that must be considered in future studies of historical geomagnetic field behavior and early tectonism associated with evolution of the world's ocean basin.

Discovered and delineated the existence of systematic down-strike amplitude variability along Mesozoic seafloor spreading anomalies (Japanese lineations) in the Northwest Pacific. Anomaly amplitudes were shown to symmetrically attenuate from a maximum located midway between bounding fracture zones. The scale (up to 400 km) and uniformity of this previously unknown phenomenon led us to speculate that it is genetically associated with physio-chemical processes fundamental to seafloor spreading, processes that produce a real or apparent linear convex lensing of the magnetized layer between fracture zones.

Field-demonstrated the potential application of an integrated approach to detecting large uncharted bathymetric structures (i.e., seamounts) in remote areas using satellite radar altimetry and aeromagnetism. We successfully detected the presence of three large uncharted seamounts in the vicinity of

MAJOR ACCOMPLISHMENTS

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Wake Island on WESTPAC AIRMAG OPS '79. On WESTPAC AIRMAG OPS '81, we used aeromagnetics for the first time to verify the existence of an uncharted seamount in a location identified as a satellite radar altimetry anomaly. It now appears that these detection techniques used together may be effective in meeting the Navy's requirement for detecting uncharted seamounts in remote areas.

Provided new and uniquely precise constraints for interpreting the complex structure and evolution of the western Pacific Ocean basin. We have compiled a revised and expanded map of residual magnetic anomaly patterns in the western Pacific. New data sources used in the compilation of this map included over 100,000 nm of data collected on NORDA aeromagnetic operations and 250,000 nm of data collected by PROJECT MAGNET that were processed specifically for this project. The map has allowed us to: (1) redefine the tectonic setting, and possibly the origin, of the Marshall Islands; (2) relocate Hawaii-Japanese magnetic bight; (3) map previously uncharted fracture zones and fossil plate boundaries; and (4) identify the oldest known seafloor spreading anomalies in the Jurassic "quiet" zone.

Made significant progress on the Philippine Sea Magnetic Anomaly Chart.

Implemented software for image display and analysis of geophysical data bases (bathymetry, gravity, magnetic, seismic). Demonstrated the application of imaging for display, analysis and storage of conventional marine geophysical data bases, and prepared images of North Atlantic bathymetric data.

Conducted WESTPAC AIRMAG OPS '82: A total of 38,893.8 nm (15,573.3 nm at high altitude [$<6,000$ feet] and 23,320.5 nm [$>6,000$ feet]) of aeromagnetic measurements were collected on this deployment.

A preliminary analysis of these data indicates that most objectives of the deployment were accomplished. Specific accomplishments are as follows:

- We completed our aeromagnetic survey program to map low amplitude linear magnetic anomalies in the Pacific Jurassic "quiet" zone. A detailed survey of the region between our previous extension of the Mesozoic anomaly pattern and the predicted oldest crust of the Pacific was accomplished on Flights WP-2, WP-3, and WP-6. The data obtained on these flights reveal no additional lineations; this indicates that the earliest evolution of the Pacific may have occurred during a period of constant geomagnetic polarity. Alternatively, the data may indicate slower spreading rates during that period. A distinct, linear magnetic boundary identified on these flights may be a fossil plate boundary that was active during the initial rifting.

- The cancellation of Fiji-based operations reduced the amount of data collection in the Ellice basin. However, data acquired on two long-range flights out of Kwajalein (WP-7, WP-10) allowed us to extend the Phoenix lineation sequence southward to the northern boundary of the Ellice basin, as well as to map several as yet unidentified lineations within this basin. These lineations will be surveyed in greater detail on flight operations planned for FY 83. If they are seafloor spreading lineations, they define a major reorientation of the Pacific-Antarctic spreading center in late Mesozoic time.
- We conducted a flight operation of the Lyre basin to determine if Mesozoic anomaly identifications proposed by Brian Taylor could be substantiated and extended. Four closely spaced survey tracks were flown. No lineation could be established with these tracks, a result that suggests that the proposed identifications are in error. If lineations did exist in this basin, they have probably been obliterated by subsequent volcanic activity on the eastern side of the Ontong Java plateau.
- During this operation, we conducted four detailed surveys over charted seamounts to obtain magnetic anomaly values that could be used for paleomagnetic modeling.
- We made the first aeromagnetic survey verification for an uncharted seamount predicted from satellite radar altimetry data. Two other satellite-defined, uncharted seamount sites were overflown, no magnetic anomaly verification was obtained.

G. L. Maynard

Recruited and brought on board Dr. Joseph F. Gettrust.

Carried out administrative activities required to bring the Geotechnical group to NORDA from NOAA. This included bringing four people into the Division and moving laboratories from Miami to NSTL.

In EEO/Staffing activities, recruited Muriel Grim and was instrumental in bringing Lee Nastav and Dawn Lavoie on board.

Initiated Research Option Program in Very Low Frequency Propagation and was successful in obtaining funding.

Designed a Deep Towed Array Program, which was funded.

Obtained funding for Marine Seismic System downhole/site survey program and obtained personnel, equipment, and ship support to carry out work.

D. S. Lavoie

Obtained MS degree in Geology, thesis defended September 1982.

**MARINE GEOTECHNICAL BRANCH
CODE 363**

MISSION/BASIC RESPONSIBILITIES

The Marine Geotechnical Branch conducts basic and applied research and technology programs to advance the state-of-the-art in Marine Geotechnique of relevance to the design and performance of Navy systems and instrumentation. It identifies and conducts significant tractable research of major scientific and geotechnical engineering merit. As a primary marine geotechnical activity within the Navy laboratory system, the Branch provides direct support of environmental requirements of the sea floor.

Telephone Number for Marine Geotechnical Branch:
(601) 688-4906, AUTOVON 485, FTS 494

Dr. Richard Bennett, Acting Branch Head

Technical Specialties: (see Code 360)

Mr. Douglas N. Lambert, Oceanographer

Technical Specialties:

- Marine Geotechnique.
- Geological and Geotechnical Laboratory testing and equipment operation.
- Deep submergence research including in situ instrumentation design.
- In situ geotechnical probe design and development.
- State-of-the-art laboratory data acquisition systems and instrument automation.
- High-pressure transducer testing and calibration.
- Seafloor geotechnical analysis and slope stability.

Ms. Frances Lee Nastav, Physical Science Technician

Technical Specialties:

- Processing and reduction of raw data.
- Design, display, compilation of maps, graphs, illustrations for storage and publication of data.
- Editing, proofing, fabricating mock-ups for manuscript publications.
- Record maintenance.
- Library research for marine geotechnical applications.

Mr. John T. Burns, Electronics Technician

Technical Specialties:

- Design and development of piezometer probes used in geotechnical investigations.
- Operation of NORDA's high pressure test facility.
- Geotechnical instrumentation design for in situ measurements.

PAPERS/BOOKS PUBLISHED

- Bennett, Richard H., Douglas N. Lambert, Matthew H. Hulbert, John T. Burns, William B. Sawyer, and George L. Freeland, 1983. Electrical Resistivity/Conductivity in Seabed Sediments. In: Richard A. Geyer, ed., CRC Handbook of Geophysical Exploration at Sea, CRC Press, p. 333-374.
- Bennett, Richard H., J. T. Burns, T. L. Clarke, J. R. Faris, E. B. Forde, and A. F. Richards, 1982. Piezometer Probes for Assessing Effective Stress and Stability in Submarine Sediments, p. 129-161. In: Svend Saxov and J. K. Nieuwenhuis, eds., Marine Slides and other Mass Movements, Plenum Publishing Corp. 353 p. (Results from NATO Conference).
- Bennett, Richard H., F. A. Bowles, D. N. Lambert, F. L. Nastav, G. F. Merrill, G. Almagor, and W. J. Burton, 1983. Geotechnical and Geological Factors Affecting Offshore Engineering and Seabed Utilization on a Carbonate Margin: St. Croix, V.I., p. 311-321. Proc. Sec. Int'l. Offshore Mechanics and Arctic Engineering Symposium, Am. Soc. Mech. Engs.
- Hulbert, Matthew H. and Richard H. Bennett, 1982. Anomalous Pore Pressures in Mississippi Delta Sediments: Gas and Electrochemical Effects. Marine Geotechnology, p. 51-62.
- Hulbert, M. H., D. N. Lambert, R. H. Bennett, G. L. Freeland, J. T. Burns, W. B. Sawyer and P. Field, 1982. In Situ Electrical Resistivity Measurements of Calcareous Sediments, p. 156-179. In: K.R. Demars and R.C. Chaney, eds., Geotechnical Properties Behavior, and Performance of Calcareous Soils, ASTM Sp. Tech. Pub. 777, 414 p.
- Mullins, H. T., G. H. Keller, J. W. Kofoed, D. N. Lambert, W. L. Stubblefield, and J. E. Warne, 1982. Geology of Great Abaco Submarine Canyon (Blake Plateau): Observations from the Research Submersible ALVIN. Marine Geology, v. 48, p. 239-257.
- Stubblefield, W. L., B. A. McGregor, E. B. Forde, D. N. Lambert, and G. F. Merrill, 1982. Reconnaissance in DSRV ALVIN of a

"Fluvial-Like" Meander System in Wilmington Canyon and Slump Features in South Wilmington Canyon. Geology, v. 10, p. 31-36.

PAPERS/BOOKS IN PRESS

Bennett, R. H. and T. A. Nelsen. Seafloor Characteristics and Dynamics Affecting Geotechnical Properties at Shelfbreaks. SEPM Special Pub. #33, The Shelfbreak: Critical Interface on Continental Margins, D. J. Stanley and G. Moore, eds.

Bennett, R. H., J. T. Burns, and D. N. Lambert. Development of Deep-Ocean Piezometer System for the Subseabed Disposal Program (Status Report for FY 82). Sandia Annual Reports.

Bennett, Richard H., Frances L. Nastav, and William R. Bryant. Strength Measurements on DSDP Geological Materials. Initial Reports of the Deep-Sea Drilling Project, v. 44(B), Tech. Manual.

Bennett, Richard H. et al. Geotechnical Properties of Walvis Ridge, Deep Sea Drilling Project Leg 75, Site 532A. Initial Reports DSDP, IPOD.

ABSTRACTS

Bennett, R. H., F. A. Bowles, W. J. Burton, D. N. Lambert, G. F. Merrill, and F. L. Nastav, 1983. Geotechnical and Geological Factors Affecting Engineering and Seabed Utilization on a Carbonate Margin: St. Croix, V.I. The American Soc. of Mechanical Engineers 2nd Arctic and Offshore Mechanics Symposium. Houston, TX., Feb 2, 1983.

CURRENT PROJECTS/PAPERS IN PREPARATION

Almagor, G., R. H. Bennett, B. A. McGregor. Stability Studies of Surficial Sediments in the Wilmington-Lindenkehl Canyons Area, Eastern U.S. Margin. Geomarine Letters.

Bennett, Richard H. and Matthew H. Hulbert. Clay Microstructure-An Historical Perspective of Clay Fabric and Physico-Chemistry of Fine-Grained Sediments.

Bennett, R. H. and others. Organic Carbon and Geotechnical Properties Interrelationships in Selected Submarine Sediments.

- Bowles, F. A., R. H. Bennett, W. Burton, and others. Three part technical report on Geology and Geophysics, Geotechnical Properties, and Engineering Significance of the St. Croix Margin, V.I.
- Hulbert, M. H., R. H. Bennett, and D. N. Lambert. Seabed Geotechnical Parameters from Conductivity Measurements. Geomarine Letters.
- Lambert, D. N. Submersible Mounted in situ Geotechnical Instrumentation. Geomarine Letters.
- Sawyer, W. B., D. N. Lambert, and R. H. Bennett. A New Highly Accurate Single Piston Helium Pycnometer for the Rapid Determination of Average Grain Density of Powdered Materials.
- Nelsen, T. A., and R. H. Bennett. (Submitted to Sedimentology). Soft Sediment Deformation Structures on the Slope Northeast of Wilmington Canyon: A Petrographic Study of their Origin.
- McTigue, D., R. H. Bennett, and J. Lipkin (in prep.). Geomechanics of ISIMU.

PRESENTATIONS/SEMINARS

- Lambert, D. N., 1982. In Situ Geotechnical Instrumentation from a Submersible. SEPM/NORDA Research Conference on Seafloor Stability of Continental Margins. Diamondhead, Miss., October 11-15, 1982. Poster Session.

DEVELOPMENTS (INSTRUMENTATION/EQUIPMENT)

- Burns, J. T., Initiated design of an electrical interface for the ISHTE piezometer probes.
- Lambert, D. N. and J. T. Burns, Redesign of high-pressure differential pressure transducer calibrator.

MAJOR ACCOMPLISHMENTS

J. T. Burns

Initiated ordering equipment/supplies and setting up Geotechnical Instrumentation for NORDA's Sea Floor Division Geotechnical Branch.

Worked on ISHTE electronics interface drawings, piezometer drawings, and development of piezometer probe for ISHTE; redesigned high pressure differential transducer pressure calibrator (with D. Lambert).

D. N. Lambert

Completed specifications and purchase of major laboratory equipment for new Geotechnical Laboratory.

Designed set-up and modifications to temporary Geotechnical Laboratory space in Bldgs. 1105 and 1106.

Designed laboratory space and specified changes to architectural drawings for Geotechnical Laboratories in new NORDA laboratory building.

Acquired laboratory furniture for Geotechnical Laboratory in Bldg. 1105.

Participated in SEC/USN Shear Waves and Pattern Recognition Symposium.

Participated in SEPM/NORDA Research Conference.

Visited Geotechnical Laboratories at USGS, Woods Hole, and University of Rhode Island to investigate their facilities and discuss computer software and the automation and instrumentation through the use of data loggers.

Redesigned a high pressure calibrator for sensitive differential pressure transducers (with J. Burns).

Specified and ordered additional computer and laboratory equipment for the Geotechnical Laboratory.

F. L. Nastav

Conducted water content analysis on sediment samples from the Venezuelan Basin and North St. Croix Margin.

Technically assisted in finalizing plans for, and attended, the October SEPM/NORDA Conference on Seafloor Stability held at Diamondhead, Miss.

Handled the coordination of manuscripts resulting from Seafloor Stability Conference for publication in a special issue of Geomarine Letters.

Began compiling information and making contacts for sediment and acoustic data on the project "Effects of Shallow-Water Geologic Processes on High Frequency Acoustic Scattering."

Prepared computer input of the ISHTE Simulation probe data.

Worked on data analysis/diagrams, etc., on the "Seafloor Environments North St. Croix Margin and Virgin Islands Trough" project.

F. L. Nastav

Conducted water content analysis on sediment samples from the Venezuelan Basin and North St. Croix Margin.

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NORDA Technical Note 214	2. GOVT ACCESSION NO. AD-A130814	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Seafloor Geosciences Division: Missions, Technical Specialties, Accomplishments, and Activities, 1982 to Early 1983		5. TYPE OF REPORT & PERIOD COVERED Final
7. AUTHOR(s) Richard H. Bennett		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Ocean Research and Development Activity Ocean Science and Technology Laboratory NSTL Station, Mississippi 39529		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS Same		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE May 1983
		13. NUMBER OF PAGES 34
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Public release approved, distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
marine geology	structural geology	seafloor stability
marine geophysics	seismology	acoustic modeling
marine geotechnique	mass physical properties	morphology
seafloor geoscience	soil physics	mapping
sedimentology	marine geotechnical properties	plate tectonics
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
<p>The Seafloor Geosciences Division (formerly Sea Floor Division), one of six divisions in the Ocean Science and Technology Laboratory (OSTL) of the Naval Ocean Research and Development Activity (NORDA), has undergone significant change during the latter part of 1982 and early 1983 (first half of FY 83). The addition of the Marine Geotechnical Branch (Code 363) provided a new dimension to the Division's existing capabilities that reside in the Marine Geology Branch (Code 361) and the Marine Geophysics Branch (Code 362). During the year, new</p>		

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personnel joined the Division, adding technical supervision, scientists, technicians, and clerical support to the research team. In order to more realistically reflect the mission of NORDA's Code 360, the name was officially changed to Seafloor Geosciences Division in April 1983.

The Seafloor Geosciences Division now provides the Navy with expanded and advanced capabilities to conduct comprehensive geological, geophysical, and geotechnical investigations of the seafloor and sub-sea floor. Basic and applied research studies contribute to the fundamental knowledge of the oceanic crust and overlying sediments and the effective utilization of the sea floor. Interdisciplinary seafloor science and engineering investigations are ongoing in support of Navy problems, systems design, construction, and operations. Studies provide quantitative and qualitative description and understanding of the seafloor geological materials and environmental parameters directed toward advancing the state-of-the-art. The major activities and capabilities of the Branches are briefly outlined in Figure 1. Cooperative studies with other NORDA divisions, industry, academia, and other government agencies are an integral part of the Division's activities.

The informal report is a summary of the Seafloor Geosciences Division's research accomplishments and professional activities for 1982 and early 1983. The purpose is to provide NORDA Management and NORDA Offices (codes) with a timely document on the Division's productivity and accomplishments. The report also is intended to provide a means of information exchange to system commands, and other Navy activities requiring seafloor environmental data. In addition, the report is designed to increase communication channels with colleagues interested in Division activities. Most reports cited are available from the authors. Communications are invited and should be directed to Division staff members and authors.

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